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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,908	08/05/2003	Brage Golding	MSU 4.1-596	7369
21036	7590	03/21/2005	EXAMINER	
MCLEOD & MOYNE, P.C. 2190 COMMONS PARKWAY OKEMOS, MI 48864			HITESHEW, FELISA CARLA	
			ART UNIT	PAPER NUMBER
			1722	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,908

Applicant(s)

GOLDING ET AL.

Examiner

Felisa C. Hiteshew

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 5, 7, 11 and 13-17 is/are withdrawn from consideration.
- 5) ☒ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>attached</u> . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>see attached paper</u> . | 6) <input type="checkbox"/> Other: ____. |

Information Disclosure Statement

The PTOL 1449 has been received, reviewed and considered.

Claim Objections

1. Claims 5,7,11 and 13 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot be dependent upon other dependent claims. See MPEP § 608.01(n). Accordingly, the claims 5,7,11 and 13 have not been further treated on the merits.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4,6; 8-10 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Hormann, et al in view Kobayashi, et al.

Hormann, et al teaches a process for producing heteroepitaxial deposition of single crystal diamond thin films by chemical vapor deposition. Iridium (Ir) films were deposited on SrTiO₃ (strontium titanate) substrates with (001) direction orientation. The Iridium film was deposited by electron-beam evaporation on SrTiO₃ (001) surfaces varying the deposition temperatures between 280°C and 980°C. For the plasma exposure and bias enhanced nucleation (BEN), experiments were then placed in a stainless steel reactor for microwave plasma-assisted chemical vapor deposition (MPCVD). The reactor is equipped with a circular electrode for biasing as described in Ref (6). The biasing was done at a rather light temperature of approximately 920°C for 30 min at – 240V; 30mbar, 1100 W microwave power with 2% CH₄ (methane) in H₂ (hydrogen) by a 4h growth process at 770°C with 1% CH₄ in H₂. This procedure resulted in a very low nucleation density. The nucleation of highly aligned heteroepitaxial diamond crystallites was facilitated.

The difference being that Hormann, et al does not exactly teach other metal oxide substrates which may be used in the production of single crystal diamond films or a substrate which is electrically isolated from a support during the CVD.

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Kobayahi, et al is being cited for its teaching of producing a single-crystal diamond film using different substrates, such as, sapphire, strontium titanate and manganese oxide. (see column 6, lines 5-22). However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to modify and optimize the process parameter limitation, as taught by Hormann, et al with the process parameter limitation, as taught by, Kobayashi, et al. The motivation being that highly aligned diamond grains with low mosaic spread and a vanishing fraction of randomly oriented grains increase the superior properties of Ir films on SrTiO₃ for diamond nucleation as compared with pure silicon substrates.

The reference by Schreck is being cited for its teaching of also producing diamond nucleation on iridium buffer layers and subsequent textured growth for the production of single-crystal diamond films (see abstract; columns 1 and 2 on page 192, respectively).

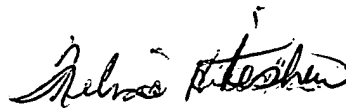
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felisa Hiteshew whose telephone number is (571) 272-1463. The examiner can normally be reached on Mondays through Thursdays from 4:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech, can be reached on (571) 272-1137. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-1463.

Information regarding the status of an application may be obtained from

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the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866- 217-9197 (toll-free).


FELISA HITESHEW
PRIMARY EXAMINER
12/11/08